8.11 CULTURAL RESOURCES

8.11.1 Affected Environment

Region of Influence

The ROI for this project area is all of PTA (which also includes BAAF), the proposed PTA Trail between Kawaihae Harbor and PTA, and the WPAA identified for acquisition.

Hawaiian Homelands

In 1920 the US Congress established the Hawaiian Home Lands Program, which provides a means by which eligible Native Hawaiians can obtain 99-year leases on Hawaiian Home Lands. Hawaiian Home Lands are intended for three purposes: residences, agriculture, and ranching (Department of Hawaiian Home Lands 2003). The Humuʻula and Piʻihonua Hawaiian Home Land parcels, consisting of 52,315 acres (21,171 hectares), are adjacent to PTA's western boundary, and the Kawaihae parcel, consisting of 10,153 acres (4,109 hectares), is on the coast north of KMR.

Native Hawaiian History and Tradition

Cultural History

PTA is part of a larger cultural landscape that includes the sacred mountains Mauna Kea and Mauna Loa and the Saddle area between them. Research by Pualani and Edward Kanahele (1999), Kepā Maly (1999), Holly McEldowney (1982), Charles Langlas (Langlas et al. 1997), and Usha Prasad and Keone Nunes (SRP 2002), among others, has helped to clarify the significance of this cultural landscape.

PTA is culturally significant for several reasons besides its nearness to the well-known heiau Ahu a ʻUmi and to the Mauna Kea summit area. The PTA region provided a rich resource zone that supported traditional activities that included bird hunting for both feathers and meat, quarrying volcanic glass, and providing lithic workshop areas for finish work on the many Hawaiian koʻi or adzes known to be produced from Mauna Kea basalt. The Saddle region also served as a much-used passage for travelers moving both cross-island and to the Mauna Kea and Mauna Loa summits. The area is rich with cave shelters due to the extensive lava tube systems found in the area. These sites provided not only shelter from the harsh elements but were also a source of scarce water supplies, due to the low rainfall within the region. Archaeological studies demonstrate that ancient Hawaiians practiced different economic activities in this uplands area. Radio-carbon dating of PTA sites (primarily caves) indicates occupation between the 12th and 18th centuries, and a few reports indicate the presence of burials at PTA (Haun 1986; Athens and Kaschko 1989; Reinman et al. 1998). Some studies suggested that Native Hawaiians planted sweet potato crops in stony areas (Reinman and Schilz 1999), but more recent work supports the hypothesis that excavated pits were used for enhancing bird (petrel) habitat (Moniz-Nakamura 1999; Williams 2002a, 2002b).

The Ahu a ʻUmi heiau on the slopes of Hualālai south of PTA is said to have been built by the legendary chief ʻUmi a Līloa around 1600. Both ʻUmi and his father, Līloa, are credited,

in different accounts, with unifying the island of Hawai'i and with creating the system of land division that persisted through the end of the traditional era. In a broad sense, the entirety of Mauna Kea, whose southwestern slopes form part of PTA's base, is considered holy. From cultural practitioners to academic specialists to oral history informants, that sacredness has been expressed in a number of different ways that are briefly summarized here.

Several deities are associated with the mountain, perhaps most famously Poli'ahu, the snow goddess of the summit, and Lilinoe, embodying the mist and rain of the Pōhakuloa area. In legend, the region was also the scene of conflict between Poli'ahu and the fire goddess Pele; in hard physical reality, a similar ancient meeting of volcanic fire and mountain ice produced exceptionally high-quality basalt that was prized by traditional adze makers.

Attempts to translate the Hawaiian sense of Mauna Kea's spiritual meaning for a general audience often focus on two concepts, hiapo (first-born, recipient of special privileges and responsibilities) and lōkahi (unity or harmony). The mountain is seen as the first-born child of Wākea and Papa, the original father and mother, and thus as a personal ancestor of living Hawaiians. It is also seen as the piko or navel through which the island of Hawai'i came into being. In addition, its height helps to make it sacred.

This sense of Mauna Kea as a living elder and holder and transmitter of tradition complements a sense of lōkahi, in which the mountain participates in the larger cycle of life, where each element has a crucial part to play. For example, its height attracts clouds, which bring precious rain. Through hiapo the mountain reaches up to the sacred realm, while through lōkahi it reaches out to the natural world—Hawaiian tradition did not see those two realms as separate.

Water is an important part of the mountain's sacred aspect. These sacred water sources include springs and their importance as part of cultural landscapes, rain clouds attracted by the peak, mist and snow representing its deities, and the icy water of Lake Waiau near the summit, prized for use in religious and medical practice. Water that had not touched the ground was considered especially precious, whether it collected in the cupped part of a taro leaf, in high Lake Waiau, or in the top of a bamboo shoot. Interestingly, the ahupua'a that stretches from the Hāmākua shore to include both Mauna Kea and Mauna Loa peaks and much of the land base for PTA is named Ka'ohe, or bamboo—a plant that was often used as a water carrier.

Traditional Activities

It is considered unlikely that the chilly heights of the Saddle area and above were ever the site of permanent homes, but many people passed through the region in pursuit of the numerous and unique natural resources available. These individuals included bird hunters, and gatherers of various plants and other forest resources, and craftsmen in search of high quality wood and fine quality basalt for adze manufacturing. Lava that cooled quickly on the frigid mountaintop yielded an especially fine-grained form of basalt that could be turned into high-quality adzes and other tools in the days before metal was available. Quarry sites were probably workshops, with associated shrines and temporary dwellings located in caves at lower warmer elevations, some of them within PTA.

Craftsmen turned to the high forest when they needed particularly large trees from valuable upland hardwoods such as māmane. According to Kanahele and Kanahele, the upper slopes were considered more sacred than the lower forests and were left alone as much as possible as conservation areas; when one of the larger and more valuable trees was taken, a major offering, often a human sacrifice, was given in return.

Perhaps the most valuable of the traditional forest resources were the birds. Songbirds were hunted for their plumes, and seabirds that nest were hunted as food, especially the delicacy of the chicks.. Participants in early 20th century interviews remembered a variety of bird-catching techniques, from tethering a live ʻio (hawk) next to a trap, to setting tiny nooses alongside lehua blossoms, to snaking a gummed snare made of ʻieʻie vines into a shallow cave to catch ʻuaʻu chicks, a delicacy reserved for the aliʻi. Most techniques required a great deal of finesse and patience and, in the case of the larger birds, strength and speed as well. Natural holes in the lava beds were improved to make them more attractive nesting places. Birds hunted for their feathers were, hunters recalled, released again in viable condition (Reinman et al. 1998a; Moniz-Nakamura 1999).

Cows, sheep, and other ungulates are a post-contact introduction, but as they were released into the uplands and multiplied, hunting them became a pastime and sometimes a living, pursued by Hawaiian and haole alike. For decades, hunting of the wild/feral creatures continued as more structured and privately owned ranching began to grow. Hawaiian participation, both in the wild hunts and in ranching, has become an island tradition in its own right.

People using the upland resources, as well as people traveling cross-island, developed a network of trails in the prehistoric and early historic eras. Some of those trails are now underneath lava flows, others lie under modern roads, and others may be of questionable location and antiquity, but it is clear that a number of trails crossed the Saddle region connecting the various coastal districts around the island with one another. The Ahu a ʻUmi heiau derives some of its importance from its location at the juncture of several of these trails.

Historic Overview

Pōhakuloa Training Area

In the late 1800s owners of two large ranches competed for the rights to raise cattle and sheep and to hunt feral animals in the Saddle Region. John Parker II held a lease to the Kaʻohe lands of PTA from sometime before 1876 through 1891. The Waimea Grazing and Agricultural Company leased Humuʻula to the east of PTA from Kamehameha III around 1860 and raised sheep and also killed wild cattle for their hides. The company built a wagon road from its remote sheep station along the current Saddle Road in Humuʻula to Waimea, through PTA, to transport wool to the harbor at Kawaihae. A portion of this road still remains within and to the east of PTA. The company also raised sheep in the portion of Waikōloa that forms the WPAA, establishing the Keʻāmuku Sheep Station.

By 1891 the Humuʻula lease was held by the Hackfields' Humuula Sheep Station Company, which in that year obtained the lease for the east side of Kaʻohe, while Parker continued to lease the west side. The company built a number of stone walls in the 1890s, some of which may be the stone walls still standing in the northeastern part of PTA. After 1900 Parker Ranch was expanded to include the Humuula Sheep Station Company and most of the lands in the Saddle (Langlas et al. 1997).

PTA's use as a military installation began in 1942 with the building of the Kaūmana Road for military access between Hilo and Waimea. The road is now known as Saddle Road (SH200), which served as the forerunner to the development of the Saddle Training Area, which primarily consisted of BAAF and the PTA cantonment area. Many members of the local community have, or have had, relatives who worked or trained at PTA. Most of the cantonment area is composed of Quonset huts dating from 1955 to 1958 (Eidsness et al. 1998, 31).

Kawaihae Military Reservation is located on fill land built onto the reef of Kawaihae Bay in the ahupuaʻa of Kawaihae 1 in the district of South Kohala. From Kawaihae Harbor, the proposed military vehicle trail will extend southward and inland through the other ahupuaʻa that make up South Kohala, Kawaihae 2, and Waimea.

Previous Consultations and Reports

Areas of Traditional Importance Surveys

Social Research Pacific (SRP) (2002) has completed a draft report of an oral history survey of PTA, focusing on place names, trail systems, and known Native Hawaiian built structures. The report includes information gleaned from previous works, including McEldowney (1982), which contains oral accounts and written evidence about the Mauna Kea summit area; other various early accounts from western visitors passing through the area (e.g., Kumu Pono Associates 1997, 21); and myth and legend material found in Elbert (1959) and Kamakau (1992).

Additionally, SRP (2002) conducted interviews with 29 individuals, both Native Hawaiians and other long-time residents of the island of Hawaiʻi familiar with the area. A field visit with eight of the informants was made to Ahu a ʻUmi heiau, located west of PTA on the slopes of Hualālai, the only heiau in the Saddle area. Extensive information was gathered about the heiau, which served during the historic period as a resting place along the trails that traversed the central part of the island. The report includes a description of the heiau recorded by Jacques Remy in 1853, based on an interview with Kanuha, an extremely elderly chief at the time of the interview (SRP 2002).

Informants reported the presence of burials both from observation and from oral traditions, but no exact burial locations could be recalled. Informants did know of the continued use of old trails that crossed PTA and of the persistence of bird hunting, one of the major traditional uses of the area from prehistoric times into the early part of the 20th century. Informants described the use of modified lava blisters (bubbles in the lava flows) to encourage nesting and trap birds. A list of 20 potentially significant place names within and

around the vicinity of PTA was prepared; however, little or no oral historical information could be collected concerning these places (SRP 2002).

Historic Building Surveys

The DPW Building List includes 138 structures at PTA that are of sufficient age to be eligible for the NRHP. Kenneth Hayes of the USAG-HI DPW Environmental staff has conducted a survey and condition assessment of historic structures. This report is in progress.

Archaeological Surveys

Inventory surveys of PTA began in the 1960s and 1970s, supported by the Bishop Museum (Rosendahl 1977). Since the 1980s, many archaeological studies have been conducted at PTA, mostly for regulatory compliance (e.g., Cox 1983; Haun 1986; Hommon and Ahlo 1983). Other studies at PTA include Athens and Kaschko (1989), Reinman and Schilz (1993, 1994, 1999), and Streck (1985, 1986, 1990). Surveys in the northern section of PTA include those of Barrera (1987), Kalima and Rosendahl (1991), and Welch (1993). A biological inventory of cave and lava tube systems within PTA recorded cultural resources at the cave entrances and within the underground system (Pearthree, Stone, and Howard 1994). Additional archaeological surveys are in progress.

There have been many archaeological investigations of the lands traversed by the PTA Trail corridor, including Barrera and Kelly (1974), Clark (1981), Hammatt and Shideler (1989), Hammatt et al. (1988), Langlas et al. (1997), Clark and Kirch (1983), Clark (1987), and Soehren (1980). Cox (1983) conducted a reconnaissance of the military vehicle trail between Kawaihae Harbor and PTA.

Most of the early archaeological surveys at PTA took place in the west and southwest portions of the training area along or off Bobcat Trail. In 1985, PHRI conducted a survey of the Bobcat Trail Habitation Cave Site and the surrounding kīpuka (Haun 1986), and, in 1987, Athens and Kaschko (1989) surveyed the heavily forested and (at the time) undeveloped region of the Multi-Purpose Range Complex (MPRC). In 1992, Ogden revisited the MPRC and conducted data recovery excavations of sites to be affected, as well as a survey of an additional 20,000 acres (8,090 hectares) (Reinman and Schilz 1999). This resulted in the discovery of 48 new sites.

On the east side of PTA, surveys were not initiated until 1993, when BioSystems Analysis conducted an aerial and pedestrian inventory survey of 6,700 acres along both sides of Redleg Trail (Reinman and Pantaleo 1998b). Following this work, Ogden surveyed four areas east of Redleg Trail totaling about 970 acres (2,710 hectares) (Williams et al. 2002). Later, an additional area of 2,640 acres (1,070 hectares) to the east of the trail was surveyed and Phase II surface collection and testing conducted of sites in areas previously surveyed (Williams 2002 a and b). In an area with an expected low density of sites, 67 sites and over 1,800 excavated pits were recorded.

The USAG-HI Historic Preservation Plan (HPP) (Eidsness et al. 1998) includes near-term and long-term cultural resources objectives for the PTA commander and the cultural

resources manager. The management action in the HPP is being implemented. The objectives of the plan also include monitoring issues, site visitation rules, human remains concerns, curatorial facilities, database implementation and upkeep, site protection, and agency reviews. The PTA Environmental Office contains a climate- and pest-controlled curation facility that houses all cultural materials collected from past surveys at PTA.

Part of the preservation plan's background study is a review of all exploitation activities that occurred at PTA, beginning with bird hunting and quarrying at Mauna Kea and ending with historic hunting and livestock ranching. Descriptions of the Hawai'i cattle industry include John Palmer Parker's role as the main rancher in the international beef trade and Parker Ranch's part in assisting with the World War II effort.

Approximately 30 percent of PTA has been surveyed. A survey of areas that will be directly impacted by the Proposed Action was completed in 2002, and this report is in progress. Most sites recorded at PTA have been recommended as NRHP eligible, but no formal determinations of eligibility have been made. Formal evaluations of many of the sites are now in progress. Inventory level surveys have recently been completed for Training Areas 1, 3, and 4.

Known Prehistoric and Historic Resources

Pōhakuloa Training Area

In general, archaeological resources at PTA consist of modified natural features, such as lava tubes, lava shelters, and lava blisters. A 1998 review of previous archaeological studies concluded that lava tubes made up 70 percent of all recorded sites at PTA (Eidsness et al. 1998, 31), and they remain one of the most common site types found in more recent surveys. Other site types include cairn sites, trails, volcanic glass quarries, excavated pits, and lithic workshops. Within these sites, material remains include grinding tools, charred wooden torches, gourds, cordage and matting, woven ti leaf sandals, kukui nuts, 'opihi shells, and other faunal remains. Surface features include stone-lined hearths, cupboards, rock-paved areas, low walls and platforms, rock-filled crevices, ramps, cairns, shrines, open-air shelters, and trails. The region has much value for archaeological research and has produced important information concerning bird hunting, trail systems, and short-term living conditions at higher elevations.

Reinman et al. (1998a) claim the cultural resources at PTA are important for addressing issues about Hawaiian prehistory and history in the uplands region, as well as the development of Native Hawaiian society.

The existence of approximately seven stone shrines attest to the likely ritual activity that went on at PTA. With prayers and ritual permeating traditional Hawaiian life, some of the structures at PTA may be occupational shrines (Buck 1957, 259, cited in McEldowney 1982, 1.10). Cairns (ahu) have been recorded at various terrains, either associated with trail systems or boundary markers, or as just isolated features. There appears to be no pattern to the distribution of cairns across the PTA landscape, and they have been quantified as representing between 10 and 15 percent of known sites. Cairns have also been constructed

for military purposes, although the trained eye can usually differentiate military cairns from prehistoric ones. It is also possible that some cairns were constructed for rituals.

Archaeological Resources

PTA is rich with archaeological resources, with 244 reported archaeological sites, including both prehistoric and historic Native Hawaiian sites and historic military structures (tables 8-24 and 8-25). The only site listed on the NRHP is the Bobcat Trail Habitation Cave (Site 50-10-30-5004).

Most relevant to the Proposed Action are the archaeological sites found during surveys along Redleg Trail and areas to the east. The BAX and AALFTR projects are located on the west side of Redleg Trail, and the survey conducted by BioSystems Analysis included portions of the two project areas. One site was identified within the boundaries for the BAX, Site 19490, and one within the boundaries for the AALFTR, Site 18673 (Reinman and Pantaleo 1998b). The survey also identified one site, Site 18671, a small lava tube containing cultural features and material, east of Redleg Trail just outside the AALFTR. The northernmost part of the Redleg Trail survey area lay to the east of the BAX. Site 21495, a complex of excavated pits, and Site 21671, a complex of scattered chill glass quarry locations, were located on the east side of Redleg Trail near the BAX boundary (Williams 2002 a and b). One of the four areas surveyed to the south, Survey Area III, is located across Redleg Trail immediately east of the AALFTR boundary. However, all sites recorded in this area lie in the eastern portion of the survey area well outside the AALFTR (Williams et al. 2002).

Table 8-24
Summary of Known Cultural Resources at PTA and WPAA

	Total Archaeological Sites	Sites Listed, Eligible, or needing DE	Area Surveyed for Archaeological Sites	Potential Historic Structures	Buildings Listed, Eligible, or Needing DE
PTA	244	244 (243 DE)	33,500 acres (13,557 hectares)	138	138 (DE)
WPAA	97	95 (DE)	All 23,000 acres	2	2 (DE)
PTA Trail	6	6 (DE)	Unknown	0	0

Source: IARII 2003; Roberts et al. 2003

Notes: "DE" means a site or building that has not yet been found ineligible for the NRHP and therefore must be treated as eligible pending such a finding.

GANDA conducted a recent survey of the entire proposed area for the AALFTR that revealed the presence of 21 lava tube caves, five of which were found to contain cultural materials (Table 8-26) (Roberts et al. 2003, IARII 2003). One of these had been identified during earlier surveys. All five lava tubes contained evidence of their use as shelters or temporary habitation areas, but in one site three upright stones were found on basalt ledges, suggesting that these may have been shrines. Two complexes of excavated pits and a lithic scatter representing a workshop area were also found during the survey. A total of eight archaeological sites are located in the AALFTR.

Table 8-25
Archaeological Sites Recommended as Eligible to the NRHP at PTA

State Site Number 50-10-31-	Site Type	Site Function
05000	Lava Tube	Shelter
05001	Lava tube	Shelter
05002	Wall	Ranching
05003	Lava tube	Shelter/habitation
05004	Lava tube	Shelter/habitation/religious
05005	Lava tube	Shelter/habitation/religious
05006	Trail	Transportation
05007	Trail	Transportation
05008	Trail	Transportation
05009	Trail	Transportation
07119	Wall	Ranching
10220	Lava tube	Shelter/habitation
10221	Lava tube	Shelter/habitation
10222	Lava tube	Shelter/habitation
10265	Lava tube	Shelter/habitation
10266	Lava tube	Resource procurement
10267	Lava tube	Shelter/habitation
10268	Lava tube	Resource procurement
10269	Lava tube	Shelter/habitation
10270	Lava tube	Water procurement
10271	Lava tube	Resource procurement
10271	Ahu	marker
10272	Overhang shelter	Shelter
10644	Lava tube	Shelter
10645	Lava tube	Shelter
10646	Lava tube	Shelter
10647	Lava tube	Shelter
10648	Lava tube	Shelter
10649	Lava tube	Shelter
10650	Lava tube	Shelter
10651	Lava tube	Shelter
10652	Lava tube	Shelter
10653	Lava tube	Shelter
10654	Lava tube	Shelter

Table 8-25
Archaeological Sites Recommended as Eligible to the NRHP at PTA *(continued)*

State Site Number 50-10-31-	Site Type	Site Function
10655	Lava tube	Shelter
10656	Lava tube	Shelter
10657	Lava tube blister	Shelter
10658	Lava tube	Resource procurement
14638	Site-complex (enclosures, lava tube blisters, wall, C-shape, lithic scatter, overhang shelter	Lithic workshop, resource (lithic) Procurement/shelter/workshop/trail?
17116	Lava tube	Shelter/habitation
17117	Ahu	Marker
17118	Ahu	Marker
17119	Ahu complex	Unknown
17120	Ahu	Marker
17121	Ahu	Marker
17122	Ahu	Marker
17123	Ahu	Marker
17124	Ahu	Marker
17125	Lava tube	Resource procurement
17126	Overhang shelter	Shelter
17127	Overhang shelter	Shelter
17128	Overhang shelter	Shelter
17129	Overhang shelter	Shelter
17130	Ahu	marker
17131	Overhang shelter	Shelter
17132	Overhang shelter	Shelter
17133	Overhang shelter	Shelter
17134	Overhang Shelter	Shelter
17135	Overhang shelter	Shelter
17136	Lava Tube blister	Shelter
17137	Quarry	Resource procurement
17138	Ahu complex	Unknown
17139	Lava tube	Shelter/historic butchering site
17140	Ahu	Marker
17142	Ahu	Marker
17143	Quarry	Resource procurement
17144	Overhang shelters	Shelter
17145	overhang shelter	Shelter

Table 8-25
Archaeological Sites Recommended as Eligible to the NRHP at PTA *(continued)*

State Site Number 50-10-31-	Site Type	Site Function
17147	Ahu	Marker
17148	Overhang shelter	Shelter
17149	Overhang shelter	Shelter
17150	Lava tube	Shelter/habitation
17151	Lava tube	Shelter/habitation
17153	Ahu	Marker
17154	Overhang shelter	Shelter
17155	Lava tube	Shelter (historic)
17156	Lava tube	Resource procurement/religious
17157	Overhang shelter	Shelter
17158	Lava tube	Shelter
17159	Ahu	Marker
17160	Quarry	Resource procurement
17161	Overhang shelter	Shelter
17162	Quarry	Resource procurement
17163	Lava tube	Historic shelter
17164	Quarry	Resource procurement
17165	Quarry	Resource procurement
17166	Quarry	Resource procurement
18671	Lava tube	Shelter/habitation
18672	Lava tube	Shelter/habitation
18673	Lava tube	Shelter/habitation/religious
18674	Shrine	Religious
18675	Quarry	Resource procurement
18676	Shrine	Religious
18677	Site complex	Religious
18678	Platform	Religious
18679	Trail	Transportation
18680	C-shape	Shelter
19490	Lava tube, C-shape, trail	Shelter/habitation/transportation
19491	Lava tube	Sandalwood resource procurement
19492	Lava tube	Shelter/resource procurement
19493	Overhang shelter	Shelter
19494	Overhang shelter	Shelter
19495	Lava tube	Shelter/habitation
19496	Lava tube	Water procurement
19497	Lava tube	Shelter/habitation

Table 8-25
Archaeological Sites Recommended as Eligible to the NRHP at PTA *(continued)*

State Site Number 50-10-31-	Site Type	Site Function
19498	Lava tube blister	Shelter
19499	Lava tube	Shelter/habitation/resource procurement
19500	Lava tube	Shelter
19501	Lava tube	Shelter/habitation/water and resource procurement
19502	Lava tube	Water procurement
19503	Lava tube	Shelter
19504	Lava tube	Water procurement
19505	Lava tube	Shelter/resource procurement
19506	Lava tube	Shelter/water procurement
19507	Overhang shelter	Shelter
19508	Lava tube	Water procurement
19509	Lava tube	Water procurement
19510	Quarry	Resource procurement
19511	Lava tube	Water procurement
19512	Lava tube	Shelter
19513	Lava tube	Shelter/water procurement
19514	Lava tube	Shelter/habitation/resource procurement
19515	Lava tube	Shelter/habitation/resource procurement
19516	Lava tube	Water procurement
19517	Lava tube	Water procurement
19518	Lava tube	Shelter/habitation
19519	Lava tube	Resource procurement
19520	Lava tube	Shelter
19521	Lava tube	Shelter
19522	Lava tube	Shelter
19523	Lava tube	Shelter/habitation/resource procurement
19524	Lava tube	Shelter
19525	Lava tube	Shelter
19526	Lava tube	Shelter
19527	Lava Tube	Resource procurement
19528	Trail	Transportation
19529	Lava tube	Shelter/habitation
21164	Lava tube	Shelter/habitation
21165	Lava tube	Shelter/habitation
21166	Lava tube	Shelter/habitation
21167	Quarry	Resource procurement

Table 8-25
Archaeological Sites Recommended as Eligible to the NRHP at PTA *(continued)*

State Site Number 50-10-31-	Site Type	Site Function
21168	Ahu	Marker
21169	C-shape	Shelter
21170	Ahu	Marker
21171	Trail	Transportation
21172	Trail	Transportation
21281	Lava tube	Shelter/habitation
21282	Lava tube	Shelter/habitation
21283	Site complex, lava tube	Shelter/habitation/resource procurement
21284	Ahu complex	Unknown
21285	Lava tube	Shelter/habitation
21286	Lava tube	Shelter/habitation
21287	Lava tube	Shelter/habitation
21288	Ahu complex	Marker, unknown
21289	Shrine	Religious
21290	Shrine	Religious
21291	Lava tube	Shelter/habitation
21292	Lava tube	Shelter/habitation
21293	C-shape	Shelter
21294	Lava tube	Shelter/habitation
21295	Lava tube	Shelter/habitation
21296	Lava tube	Shelter/habitation
21297	Lava tube	Shelter/habitation
21298	Ahu complex	Marker, unknown
21300	Excavated pit	Unknown
21301	Pavement	Unknown
21302	Ahu, petroglyph	Marker, unknown
21303	Lava tube	Shelter/habitation
21304	Quarry	Resource procurement
21305	Lava tube	Shelter/habitation
21306	C-shape	Shelter
21307	Ahu	Marker
21308	C-shape	Shelter
21309	Lava tube	Shelter/habitation
21310	Ahu	Marker
21311	Ahu, platform	Marker, religious
21312	Lava tube	Shelter/habitation
21313	Pits, area I	Unknown

Table 8-25
Archaeological Sites Recommended as Eligible to the NRHP at PTA *(continued)*

State Site Number 50-10-31-	Site Type	Site Function
21314	Pits, area II	Unknown
21315	Pits, area III	Unknown
21316	Pits, area IV	Unknown
21351	Site complex	Workshop
21483	Lava tube	Shelter/habitation
21484	Lava tube	Shelter/habitation
21485	Lava tube	Shelter/habitation
21486	Lava tube	Shelter/habitation
21487	Lava tube	Shelter/habitation
21488	Lava tube	Shelter/habitation
21489	Lava tube	Shelter/habitation
21490	Lava tube	Shelter/habitation
21491	Lava tube	Shelter/habitation
21492	Lava tube	Shelter/habitation
21493	Quarry, excavated pit	Resource procurement, unknown
21494	Lava tube	Shelter/habitation
21495	Site complex	Unknown
21496	Lava tube	Shelter/habitation
21497	Lava tube	Shelter/habitation
21498	Lava tube	Shelter/habitation
21499	Ahu complex	Unknown
21500	Ahu complex	Unknown
21501	Lava tube	Shelter/habitation
21502	Lava tube	Shelter/habitation
21503	Site complex	Religious
21665	Lava tube	Shelter/habitation
21666	Quarry	Resource procurement
21667	Quarry	Resource procurement
21668	Quarry	Resource procurement
21669	Quarry	Resource procurement
21670	Quarry	Resource procurement
21671	Quarry	Resource procurement
21672	Quarry	Resource procurement
21673	Quarry	Resource procurement
21674	Quarry	Resource procurement
21744	Lithic, pavement	Resource procurement, lithic workshop
21745	Lava tube	Shelter/habitation

Table 8-25
Archaeological Sites Recommended as Eligible to the NRHP at PTA *(continued)*

State Site Number 50-10-31-	Site Type	Site Function
21746	Site complex	Unknown
21747	Lava tube	Shelter/habitation
21748	Excavated pit	Unknown
21749	Lava tube	Shelter/habitation
21750	Shrine	Religious
21807	Lava tube	Shelter/habitation
21809	Lava tube	Shelter/habitation
22941	Lava tube, lithic	Resource procurement
23450	Ahu	Marker
23451	Lava tube	Shelter
23452	Enclosure	Unknown
23453	Enclosure	Unknown
23454	Modified outcrop	Unknown
23455	Excavated pit complex	Resource procurement
23456	Enclosure	unknown
23457	Trail	Transportation
23458	Quarry	Resource procurement
23459	Enclosure	Shelter
23460	Lava tube/modified outcrop	Shelter
23461	Enclosure	Shelter
23462	Ahu	marker
23463	Excavated pit complex	Resource procurement
23464	Site-complex	Shelter/habitation
23465	Lithic scatter	Lithic workshop
23466	Lava tube	Shelter/habitation
23621	Excavated pit complex	unknown
23622	Excavated pit complex	unknown
23625	Lava tube	Shelter/habitation
23626	Lava tube	Shelter/habitation

Source: IARII 2003

Table 8-26
Archaeological Sites at PTA within the AALFTR and BAX

Site No. 50-10-31-*	Site Name/Type	Probable Function	Probable Age
18673	Lava tube system	Habitation ceremonial	Late prehistoric
21285	Lava tube cave	Shelter/ habitation	Prehistoric
21299	Lava tube cave	Shelter/ habitation	Prehistoric
21306	Lava tube cave	Shelter/ habitation	Prehistoric
23463	Excavated pit complex	Possible bird nesting	Prehistoric
23465	Lithic scatter	Lithic workshop	Prehistoric
23622	Excavated pit complex	Possible bird nesting	Prehistoric
23625	Lava tube cave	Shelter/ habitation	Prehistoric
19490	Site complex: 4 lava tubes, 2 trails, 1 C-shape, 4 ahu	Habitation transportation markers	Prehistoric /historic
23450	Rock mound	Marker	Prehistoric
23451	Lava tube	Shelter	Prehistoric
23452	Enclosure	Unknown	Unknown
23453	Rock mound	Unknown	Prehistoric
23454	Modified outcrop	Unknown	Prehistoric
23455	excavated pit complex	Resource procurement	Prehistoric
23456	Enclosure	Unknown	Prehistoric
23457	Trail	Transportation	Prehistoric
23458	Chill glass quarry	Resource procurement	Prehistoric
23459	Rock shelter	Shelter	Prehistoric
23460	Lava tube/ modified outcrop	Shelter	Prehistoric
23461	Rock shelter	Shelter	Prehistoric
23462	Ahu	Marker	Unknown
23464	Site complex: overhang shelter, enclosure, modified outcrop	Shelter/ habitation	Prehistoric
23621	Excavated pit complex	Unknown	Prehistoric
23626	Lava tube cave	Shelter/ habitation	Prehistoric

Sources: Roberts et al. 2003; IARII 2003

Seventeen sites have been found in the proposed area for the BAX, including excavated pit complexes, rock shelters, modified outcrops, rock mounds, a cairn, a lava tube, a lithic scatter, and an enclosure. One site, a complex of lava tubes, trails, enclosures, and a shrine had been identified prior to archaeological survey for the Proposed Action (Reinman and Pantaleo 1998b). The GANDA survey of the entire BAX area revealed the presence of an additional 16 sites (Roberts et al. 2003). Except for the ahu or cairns, whose age is uncertain,

all features seem to be prehistoric in age. Table 8-26 lists the archaeological sites within these two project areas.

Historic Structures and Military Landscapes

The cantonment area includes 138 structures that need determinations of NRHP eligibility (IARII 2003). The cantonment area Quonset huts date from 1955 to 1958 and may qualify for listing on the NRHP under Cold War-era criteria. Other associated structures within the cantonment area, BAAF, and throughout the PTA area need to be evaluated for NRHP eligibility for either the World War II or Cold War eras. The US Army programmatic agreement document on temporary World War II buildings does not cover the Quonset huts. In addition, historic landscapes have not yet been evaluated as they relate to themes such as World War II or Cold War history.

PTA Trail

While Kawaihae Harbor has no archaeological sites, records indicate that the nearshore area contains an underwater shark heiau. Also, near the harbor to the north and east are areas rich in archaeological sites; additional sites have been located along the proposed alignment for PTA Trail as the trail approaches the installation (Table 8-27).

Archaeological investigations have revealed the presence of a large number of graves on the inland side of the highway above the harbor and town. Most of these are early historic, although a few may be late prehistoric (Clark 1983b). These include the grave of George Hueu Davis, the son of Issac Davis, buried in the Kawaihae Church cemetery, and "Macy's Grave," marked by a white obelisk that used to serve as a navigation landmark, which may be the grave of G.W. Macy, a Lālāmilo and Waimea landowner, who died in 1860 (Kelly and Nakamura 1981; 37).

Table 8-27
PTA Trail Archaeological Sites

Site Number	Site Type	Probable Function	Probable Age
50-10-05-9012	Wall	Cattle boundary	Historic
50-10-05-23601	Retaining wall	Cart road	Historic
50-10-05-23602	Mound	Marker	Historic
50-10-05-23623	Wall network	Cattle boundary	Historic
50-10-05-23624	Terrace	Possible habitation	Possibly prehistoric
none	Lava blister	Possible burial	Possibly prehistoric
none	Mound	Undetermined	Undetermined

Source: IARII 2003

West PTA Acquisition Area

The WPAA is west and north of PTA proper. Under the Proposed Action the Army would acquire approximately 23,000 acres (9,180 hectares) of fee-simple land from the Richard Smart Trust (Parker Ranch). The area is roughly triangular-shaped and lies between the west boundary of PTA, Māmalahoa Highway, and Saddle Road. The proposed land acquisition area surrounds the Waikiʻi Ranch development on its north, west, and south sides. It is would be used as a force-on-force training area.

Prior to 2002 two archaeological surveys had been conducted of small portions of the WPAA. During survey of the Waikoloa Maneuver Area, Ogden conducted a limited survey within the WPAA and identified two sites, a rock shelter (Site 22929) near one crater and a dryland agricultural complex (Site 22933) within another crater (Robins et al. 2001). PHRI conducted survey of several proposed corridors for the Saddle Road through the area and identified five sites, although two historic sites adjacent to Saddle Road were considered not eligible to the NRHP and not described or given state site numbers. The other sites included a portion of the historic Old Waimea-Kona Belt road (Site 20855), the Keʻāmuku Sheep Station (Site 23529), and two enclosures (Site 20852) that were reported by an informant to be associated with a burial (Langlas et al. 1997). The exact location of the last site has not been disclosed, and it is not known if it is included among the sites later recorded in the area.

In 2002, GANDA surveyed the entire WPAA for archaeological resources. GANDA found 90 new sites and relocated four of the seven previously known sites; thus, a total of 97 sites have been identified in the area (Table 8-28). The sites include ahu, C-shaped stone mounds (one with bone fragments), an enclosed excavated pit, mounds, a mound complex (with over 20 mounds), rock piles, enclosures, an enclosed platform, wall sections, a wall-mound-terrace complex, and a petroglyph (IARII 2003). Military features were not recorded as sites. All 94 sites recorded by GANDA are recommended as eligible to the NRHP (Roberts et al. 2003). An ancient trail, the Hualālai-Waikiʻi Trail, would have crossed the parcel, but no evidence of the trail was found during the surveys.

Known Native Hawaiian Resources

As discussed above, Social Research Pacific (SRP) is conducting an oral history survey of PTA, focusing on place names, trail systems, the practice of bird catching, and the Ahu a ʻUmi heiau, to define and locate TCPs, as defined in Section 3.11.2, and other ATIs at PTA. None of the potential ATIs identified in the draft report (SRP 2002) fall within the areas of the Proposed Action. The Ahu a ʻUmi heiau is constructed on the barren ash plain on the interior slope of Mount Hualālai, well outside of the SBCT project area, although trails that cross PTA lead to this area. A major battle was said to have occurred in the plain, with the result determining how the island would be divided after ʻUmialīloa's death. Preliminary work on the ATIs of PTA by SRP reveals that the grandparents of some kūpuna or elders were known to cross the island via ʻUmi's Road. Ahu a ʻUmi heiau was used as a resting place, and bird hunting continued into the 20th century.

ATIs may include previously identified archaeological sites. Almost all sites at PTA are Native Hawaiian sites and reflect the traditional types of activities that Hawaiians conducted in this region. Activities included procurement of lithic (stone) resources, primary preparation of tools in workshops, hunting of birds, and collection of nestling birds. A few sites incorporate ritual aspects. Streck (1986b) interprets a basalt platform on a terraced mound within a lava tube as a shrine (Site 10269). Shapiro et al. (1995) identify a grouping of rock platforms and open-air sites with stone uprights near Puʻu Koli in the southeastern portion of PTA as a place where prehistoric Hawaiian religious activities took place (Reinman et al. 1998, 17). Ritual permeated traditional Hawaiian life, including everyday work

Table 8-28
WPAA Archaeological Sites

Site No.	Site Name/Type	Probable Function	Probable Age
50-10-21-20852	Unknown	Ranching	Historic
50-10-21-20854	2 enclosures and trash scatter	Habitation Animal pen	Historic
50-10-33-20855	Road, "Waimea-Kona Belt Road"	Transportation	Historic
50-10-21-21132	Unknown	Possible burial	Unknown
1522-102	Unknown	Quarry	Unknown
1522-105	Unknown	Ranching	Historic
20854	C-shape complex	Habitation	Historic
22929	Terrace-enclosure complex	Temporary habitation/agriculture	Historic?
22935	Rock shelter	Temporary habitation	Pre-Contact/historic
23467	Enclosure	Agriculture	Undetermined
23468	Mound	Possible burial	Undetermined
23469	Mound-cairn-wall complex	Undetermined/marker	Undetermined
23470	Cairn	Marker	Undetermined
23471	Cairn	Marker	Undetermined
23472	Cairn	Marker	Undetermined
23473	Mound complex	Undetermined	Undetermined
23486	Wall	Agriculture	Undetermined
23487	Enclosure/excavated pit	Agriculture	Undetermined
23488	Mound	Agriculture/land clearing	Undetermined
23489	Mound	Ranching/land clearing	Post-Contact
23490	Enclosure	Ranching	Post-Contact
23491	Mound	Ranching/land clearing	Post-Contact
23492	Wall section	Boundary remnant	Post-Contact
23493	Mound	Ranching/land clearing	Post-Contact
23494	Cairn	Marker-painted white	Modern
23495	Wall-mound-terrace complex	Temporary habitation/agriculture	Post-Contact?
23496	Platform	Habitation?	Undetermined
23497	Enclosure-C-shape-wall complex	Possible habitation	Pre-Contact
23498	Cairn	Survey marker	Post-Contact
23499	Enclosure-concrete basin	Cistern	Post-Contact
23500	Parallel walls	Possible cattle chute	Post-Contact
23501	Petroglyph	Rock art	Pre-Contact
23502	Cairn	Marker	Undetermined
23503	Cairn	Marker	Undetermined
23504	Cairn	Marker	Undetermined
23505	Enclosure-platform	Possible burial	Pre/post-Contact
23506	Wall	Possible cattle chute	Post-Contact
23507	Rock shelter	Temporary habitation	Pre-Contact
23508	Terrace	Agriculture?	Undetermined
23509	Mound complex (20+)	Quarry material?	Post-Contact
23510	Mound (on Pu'u Iwa'iwa)	Survey marker	Post-Contact
23511	C-shape	Temporary habitation	Pre-Contact
23512	Enclosure	Permanent habitation (near old Mama road)	Post-Contact

Table 8-28
Archaeological Sites *(continued)*

Site No.	Site Name/Type	Probable Function	Probable Age
23513	Cairn	Survey marker?	Modern?
23514	Cairn	Survey marker?	Modern?
23515	C-shape	Temporary habitation	Post-Contact
23516	Retaining wall	Road bed-Keʻāmuku Station	Historic
23517	Enclosure, mound, burial	Military training/cremation burial	multiple
23519	Wall-enclosure	Boundary/habitation	Historic
23520	Mounds complex	Land clearing	Post-Contact
23521	Mounds	Land clearing/quarrying	Post-Contact
23522	Mound complex	Land clearing	Post-Contact
23523	Terrace	Land clearing	Post-Contact
23524	Cairn	Marker	Post-Contact
23525	Mound	Marker	Historic/modern
23526	Enclosure remnant	Ranching/quarrying?	Historic
23527	Pictograph	Rock art	Pre/post-Contact
23528	Cairn	Marker	Historic/modern
23529	Cairn	ahupuaʻa boundary marker	Historic
23530	Cairn	ahupuaʻa boundary marker	Historic
23531	Cairn	ahupuaʻa boundary marker	Historic
23532	Cairn	ahupuaʻa boundary marker	Historic
23533	Cairn	Marker	Historic/modern
23534	Mound	Marker	Historic/modern
23536	Mound	ahupuaʻa boundary marker	Historic
23537	Mound	ahupuaʻa boundary marker	Historic
23538	Mound	Marker/land clearing	Historic/modern
23539	Keʻāmuku Village complex	Sheep-cattle station: permanent habitation; animal pens; possible burial.	Historic
23540	Retaining wall	Possible historic road section.	Historic
23541	Enclosure complex	Sheep farming	Historic
23542	C-shape	Temporary habitation/hunting?	Historic
23543	Mound complex	Land clearing/road material?	Historic
23574	Mound	Land clearing/marker?	Historic
23575	Mound complex	Land clearing/road material?	Historic
23576	Concrete structure	Foundation	Historic
23577	Mound complex	Land clearing/road material?	Historic
23578	Retaining wall	Possible road	Historic
23579	Mound-terrace-enclosure complex	Temporary habitation; agriculture?	Historic
23580	Mound	Land clearing/road material?	Historic
23581	Mound-mod. outcrop complex	Land clearing/road material?	Historic
23582	Mound	Land clearing/road material?	Historic
23583	Mound complex	Land clearing/road material?	Historic
23584	Mounds	Land clearing/road material?	Historic
23585	Mound complex	Land clearing/road material?	Historic
23586	Mound complex	Land clearing/road material?	Historic
23587	Mound	Land clearing/road material?	Historic
23588	Faced mound	Marker?	Historic
23589	Mound	Land clearing/road material?	Historic
23590	Mound complex	Land clearing/road material?	Historic

Table 8-28
Archaeological Sites *(continued)*

Site No.	Site Name/Type	Probable Function	Probable Age
23591	Lava tube	Temporary habitation; burial	Pre-Contact
23592	Mound	Marker	Historic/modern
23593	Mound complex	Markers	Historic/modern
23594	Mound	Marker/possible temporary habitation	Historic?
23595	Mound complex	Land clearing/road material?	Historic/modern
23596	Mound	Land clearing	Historic/modern
23597	Mound	Land clearing	Historic/modern
23598	Mound complex	Land clearing?	Historic/modern
23599	Mound complex	Quarry piles/ranching?	Historic/modern
23600	Mound	Land clearing	Historic/modern
23620	Mound complex	Land clearing	Historic/modern

Source: IARII 2003, Roberts et al. 2003

activities, and some of the religious structures at PTA may be occupational shrines, where fowlers, quarry workers, and woodcutters recited formulas and made offerings connected with their work.

Most of the sites in the WPAA are associated with historic era agriculture and ranching activities. Only 10 sites are clearly or possibly of traditional Native Hawaiian origin. These mainly consist of a few agricultural terraces and enclosures and habitation shelters. A few sites may be of special importance to Native Hawaiians: a basalt ledge with a petroglyph, and a boulder face with an anthropomorphic red pigment pictograph.

Most sites along the PTA Trail easement are related to cattle ranching.

Potential for Unknown Resources

Potential for unknown resources exists within unsurveyed areas of the PTA ordnance impact area because it in fact has not been surveyed, except for very small discrete areas. There is a very low potential for sites to be found in the northern areas, which are also unsurveyed. These areas are very dissimilar geologically from areas where sites have been found, with substrates of very old Mauna Kea lava flow. In addition these areas have also been heavily utilized by both hunters and the military for many years. Figure 8-33 provides an overview of archaeological sensitivity areas within the installation.

8.11.2 Environmental Consequences

Summary of Impacts

Cultural resources impacts related to the Proposed Action at PTA vary depending on the location and nature of the project. The five significant impacts primarily relate to the construction phase and range uses in PTA and the WPAA. As explained in the mitigation sections below, most of these impacts would be mitigated by compliance with the PA the Army is developing in consultation with the Hawai'i SHPO. The draft PA provided in Appendix J (dated May 16, 2002) was current when this document was printed. Because

Figure 8-33
Archaeological Sensitivity Areas at Pōhakuloa Training Area

consultation on the PA is ongoing, this draft PA may have been revised since that time. Mitigation measures for archaeological resources or ATIs would include surveys to identify sites, evaluation of NRHP eligibility, avoidance or data recovery of eligible sites, and IDPs. Impacts on ATIs or TCPs, as defined in Section 3.11.2, would be mitigated through avoidance, and such mitigation may reduce impacts to less than significant. Such mitigation would be developed in consultation with the SHPO and the Native Hawaiian community, in accordance with the provisions of the PA. Documentation of such ongoing consultation is provided in Appendix J.

Four less than significant impacts include the risk to archaeological sites from constructing the FTI, the risk to undiscovered archaeological sites in areas of low potential for subsurface archaeological resource, the risk to historic architecture and landscapes from installation of cables and conduits, and the risk to archaeological sites from troop travel from Kawaihae to PTA. These impacts would be mitigated by complying with an IDP, complying with the Secretary of the Interior's Standards for Rehabilitation of Historic Buildings, and implementing a monitoring plan by installation personnel. Table 8-29 summarizes the potential impacts on cultural resources at PTA.

Proposed Action (Preferred Alternative)

Significant Impacts Mitigable to Less than Significant

Impact 1: Impacts on Areas of Traditional Importance. SRP (2002) is conducting a TCP survey at PTA to identify ATIs. As noted previously, evidence indicates the possible presence of ATIs, including burials in the ROI of PTA, although the survey did not identify any ATIs within the project areas. Informant interviews (Langlas et al. 1997, 135) indicate burials may have been disturbed during the original construction of BAAF. Further investigations to locate burials in the BAAF have resulted in negative findings for burial sites or the identification of human remains.

There would be no noise impacts on ATIs at Mauna Kea because the noise analysis shown in Section 8.6 indicates that noise contours relating to ordnance use and construction under SBCT would not extend much beyond the PTA boundaries.

Conducting military training at the WPAA would limit access to the property. There are cultural resources of Native Hawaiian origin on the property, and it is possible that some of these resources constitute ATIs. Converting the use of the parcel to military training may also damage or destroy any unrecorded sites.

Table 8-29
Summary of Potential Cultural Resources Impacts at PTA

Impact Issues	Proposed Action	Reduced Land Acquisition	No Action
Impacts on archaeological resources from range and facility construction	⊘	⊘	○
Impacts on archaeological resources from training activities	⊘	⊘	○
Impact on archaeological resources from construction of FTI	⊙	⊙	○
Impacts on ATIs	⊘*	⊘*	○
Impacts on undiscovered archaeological resources in areas of low potential	⊙	⊙	○
Impacts from installation information infrastructure architecture construction	⊙	⊙	○
Impacts on archaeological sites from road construction	⊘	⊘	○
Impacts on historic buildings	⊘	⊘	○
Impacts on archaeological sites from road use	⊙	⊙	○
Impacts on archaeological sites from construction of the ammunition storage facility.	⊘	⊘	○

In cases when there would be both beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

* Impacts may be mitigable to less than significant.

LEGEND:

⊗ = Significant
⊘ = Significant but mitigable to less than significant
⊙ = Less than significant
○ = No impact
\+ = Beneficial impact
N/A = Not applicable

One FTI antenna will be placed on Mauna Loa, nine others will be located around PTA and the WPAA, and one more will be erected at Kawaihae. While the precise locations of the FTI sites will avoid archaeological resources, Mauna Loa has been identified as a particularly sacred element of the Native Hawaiian cultural landscape. While the antennas would be erected on top of an existing support structure, the construction may be considered to have an adverse effect on the nature of the cultural landscape. ATIs and burials, if located within the area of construction activities or new training areas, would be at risk of damage or destruction as a result of the Proposed Action. Impacts could be caused by human presence in the area, physical disturbance from human or vehicle passage, or actual damage from excavation or erosion. USARHAW is considering the mitigations described below, which may reduce impacts to less than significant.

Regulatory and Administrative Mitigation 1. Facility construction or training area uses would be designed to avoid identified ATIs and to limit visual impacts on traditional cultural landscapes by site location, design, and orientation, where feasible. Mitigation for impacts on

the cultural landscape could include consulting with the Native Hawaiian community to determine the extent of such impacts and possible means of avoiding or limiting them.

If identified TCPs or ATIs, as defined in Section 3.11.2, could not be avoided because of interference with the military mission or risk to public safety, USARHAW would reopen consultation to identify impacts and develop appropriate mitigation measures. Such mitigation would be developed in consultation with the SHPO and the Native Hawaiian community, in accordance with the provisions of the PA.

The Army has identified Native Hawaiian burial sites in the SBCT ROI and completed notification and consultation for these burial sites in accordance with NAGPRA and, for the most part, left these human remains in place. In the event of any impacts on any burial sites, or an inadvertent discovery of Native Hawaiian human remains or funerary objects, the Army would abide by all notification and consultation requirements outlined in Section 3 of NAGPRA.

Additional Mitigation 1. Potential mitigation measures for this impact include expanding access to unaffected TCPs or traditionally important places for members of the Native Hawaiian community, in accordance with American Indian Religious Freedom Act and Executive Order 13007 on Sacred Sites.

Impact 2: Impacts on archaeological resources from range and facility construction. The AALFTR is to be built on Range 3 and Range 8 extending into the ordnance impact area and along the west side of Redleg Trail. The ordnance impact area has UXO and restricted access. The northern BAX parcel extends into the ordnance impact area and north of the trail. There would be no increased impacts on archaeological resources in the ordnance impact area as a result of the proposed action.

Nine sites are within the proposed AALFTR area. Site 18673 (an extensive lava tube system containing cultural features and materials) had been previously located within the project area during the survey along the Redleg Trail (Reinman and Pantaleo 1998b). The recent SBCT survey in the AALFTR area (Roberts et al. 2003) identified an additional four lava tube cave sites. All five lava tubes contained evidence of their use as shelters or temporary habitation areas, but in the Site 18673 lava tube, three upright stones were found on basalt ledges, suggesting that these may have been shrines. The other sites consist of two complexes of excavated pits and one lithic scatter. All sites are Native Hawaiian sites that have not been formally evaluated for the NRHP. A total of 17 sites may be affected by construction of the proposed BAX; none of these have been evaluated for eligibility for the NRHP. Site types include excavated pit complexes, a complex of lava tubes with associated trails and cairns, rock shelters, modified outcrops, rock piles, a stand-alone cairn, a lava tube, a lithic scatter, and an enclosure. Potential impacts include site destruction or damage from construction of BAX/AALFTR facilities.

Facility and range construction involves grubbing vegetation, ground softening, grading site surfaces, subsurface excavation, and movement of heavy construction equipment. All of these activities, particularly ground softening, would result in direct damage to or destruction

of unidentified archaeological resources, or indirect damage by contributing to soil erosion. Cultural resources within lava tubes would be particularly subject to damage as a result of ground softening activities prior to construction of the BAX. USARHAW is considering the mitigations described below, which would reduce impacts to less than significant.

Regulatory and Administrative Mitigation 2. Before construction begins, any unsurveyed areas would be surveyed and sites would be evaluated for eligibility to the NHRP. After evaluation, eligible sites would be flagged for avoidance. All projects would be designed to avoid all recorded archaeological sites. If identified archaeological sites or newly discovered sites could not be avoided, USARHAW would mitigate the damage to the sites through data recovery or other mitigation measures determined through consultation, in accordance with the PA. To address the accidental discovery of archaeological sites, human remains, or cultural items, an IDP would be developed in accordance with the PA. The mitigation measures and implementation of the PA would reduce any impacts on archaeological resources to less than significant.

Additional Mitigation 2. Potential mitigation measures for this impact include constructing a natural and cultural resources visitor center at PTA, adjacent to the new Saddle Road alignment. The visitor center would provide interpretive displays of the biological and cultural resources of not only PTA but also the region between Mauna Loa and Mauna Kea and would include a small theater for interpretive video or live presentations. The center also would house the PTA resource managers and lab facilities.

Impact 3. Road construction impacts on archaeological sites. Acquisition and construction of PTA Trail would occur along a different alignment than the trail now used by military units traveling from Kawaihae Harbor to PTA. The seven cultural resources identified in the trail corridor, sites near the corridor, and in or near construction staging areas may be adversely affected during construction. Many archaeological sites have been identified near the northern end of the trail alignment.

PTA Trail runs inland from the harbor and then turns south paralleling the current highway just before reaching the burial grounds that lie above Kawaihae town. It passes John Young's house on the coastal side of the property, and then turns inland again as it crosses the lands of Pu'u Koholā National Historic Park between Young's homestead and the two heiau. The route as established avoids all archaeological and historic sites in the Kawaihae area, but any alteration in the alignment could result in impacts on historic properties.

Constructing PTA Trail would involve grubbing vegetation, grading soil, and the regular use of heavy equipment. This activity could expose or disturb surface or subsurface cultural resources. Off-road movement of construction vehicles also could cause erosion, which could lead to damage of undiscovered sites in the vicinity of project operations. All of these activities could result in direct destruction or damage of archaeological resources or indirect damage by contributing to soil erosion. USARHAW is considering the mitigations described below, which would reduce impacts to less than significant.

Regulatory and Administrative Mitigation 3. Mitigation for these impacts would be the same as that identified above as Regulatory and Administrative Mitigation 2. This mitigation would reduce this impact to less than significant.

Additional Mitigation 3. No additional mitigation has been identified.

Impact 4: Impacts on archaeological resources from training activities. In addition to the 26 sites within the BAX and AALFTR project areas, 97 archaeological sites (both prehistoric and pre-military historic) have been located within the WPAA. Site types on the parcel include ahu, mounds and mound complexes, an enclosed excavated pit, rock piles, enclosures, partial enclosures (C-shapes), an enclosed platform, wall sections, wall-mound-terrace complexes, a petroglyph, a pictograph, a sheep-cattle station complex, and a historic road.

Training activities on PTA and the WPAA under the Proposed Action would result in increased access by ground troops into the training areas, resulting in possible impacts on archaeological sites, off-road vehicular movement by Legacy Force and Strykers, cleanup of unexploded ordnance, and subsurface excavations related to troop maneuvers (e.g., field fortifications and obstacle placement). Live-fire activities on PTA ranges could damage surface or subsurface resources from direct impacts of munitions or explosions, although such activities are directed toward established live-fire ordnance impact areas. Activities such as ordnance removal, construction of field fortifications or defensive positions, and off-road vehicular movement could cause site destruction or damage directly or indirectly through soil erosion. As discussed in Section 8.9, soil erosion is expected to increase at PTA under the Proposed Action. Unrestricted Stryker maneuvering is identified as a potential source of damage to archaeological sites. This type of damage would be more likely in the WPAA than at the AALFTR or BAX, based on the Army's preliminary maneuverability maps for the installation and the dozens of archaeological sites located within the unrestricted maneuvering area. These sites would be at significant risk of damage from training exercises through direct and indirect effects of mounted maneuvers.

Regulatory and Administrative Mitigation 4. Eligible sites would be flagged and mapped on a range control GPS map, and installation cultural resources staff would monitor the sites regularly. Participants in training activities on the ranges would be ordered to avoid identified sites. To address the accidental discovery of archaeological sites, human remains, or cultural items, an IDP would be developed in accordance with the PA. The mitigation measures and implementation of the PA would reduce any impacts on archaeological resources to less than significant.

Additional Mitigation 4. No additional mitigation has been identified.

Impact 5: Impacts on historic buildings. Keʻāmuku Sheep Station, Site 23539, has eight features, including three habitation foundations and remnants of three outbuildings. There is historic debris, wood from former structures, and chicken coops on or near the features (Roberts et al. 2003, 70-72). These buildings may be put at risk from military use, particularly as a result of training exercises that may result in damage to the buildings. Military training in the new range may result in damage to these historic buildings from vandalism or fire, among other

possible impacts. A Range Maintenance Facility would be built on the west side of the PTA cantonment area, approximately 300 feet (91.4 meters) north of the main entrance from Saddle Road. The cantonment area contains Quonset huts dating from 1955 to 1958 that have not been evaluated for NRHP eligibility as Cold War era properties. Constructing the Range Maintenance Facility would require demolishing eight of these Cold War era buildings (Building numbers T187, T188, T17, T19, T20, T31, T3, and T2).

The Proposed Action would upgrade the 4,750-foot (1,448-meter) runway at BAAF to accommodate C-130 and C-17 aircraft. BAAF was built in 1956 (Langlas et al. 1997, 50) and is a potential Cold War site.

Regulatory and Administrative Mitigation 5. The Army would require, by way of range management protocols, WPAA buildings to be avoided. Range control could require the area around the buildings to be off-limits to military training. This limitation might not entirely prevent vandalism, but it would limit direct damage from military training.

If WPAA buildings cannot be avoided or protected from damage, the Army would document the buildings in accordance with the standards of the Historic American Building Survey and the Historic American Engineering Record (HABS/HAER).

If historic buildings at PTA cantonment area or at BAAF, or the airfield itself, are found eligible for listing in the National Register, USARHAW would document them in accordance with the standards of the Historic American Building Survey and the Historic American Engineering Record (HABS/HAER). Evaluation and documentation would be conducted in compliance with Section 106 of the NHPA for all SBCT project activities.

USARHAW is consulting with the SHPO and other interested parties and Native Hawaiian organizations on a PA, which, when executed, would provide a method for the Army to comply with the NHPA. If the PA is not signed, the Army would comply with the NHPA by following the procedures in 36 CFR 800. If WPAA buildings could not be avoided or protected from damage, the Army would document the buildings in accordance with HABS/HAER standards and the NHPA.

Additional Mitigation 5. No additional mitigation has been identified.

Impact 6: Impacts on archaeological sites from construction of the ammunition storage facility. The ammunition storage facility project involves the construction of three earth-covered ammunition storage buildings adjacent to existing ammunition storage buildings. There is one site complex (site 23455) of pahoihoe pits so there is a potential for a significant impact.

Regulatory and Administrative Mitigation 6. Before construction begins, any unsurveyed areas would be surveyed and sites would be evaluated for eligibility to the NHRP. After evaluation, eligible sites would be flagged for avoidance. All projects would be designed to avoid all recorded archaeological sites. If identified archaeological sites or newly discovered sites could not be avoided, USARHAW would mitigate the damage to the sites through data recovery or other mitigation measures determined through consultation, in accordance with the PA. To

address the accidental discovery of archaeological sites, human remains, or cultural items, an IDP would be developed in accordance with the PA. The mitigation measures and implementation of the PA would reduce any impacts on archaeological resources to less than significant.

Additional Mitigation 6. No additional mitigation has been identified.

Less than Significant Impacts

Impacts from installation information infrastructure architecture construction. I3A would involve laying cables and conduits throughout the PTA cantonment area and out to the ranges, motor pool, and other facilities. These would be both underground and aboveground conduits. Excavation to lay cabling and conduits for the I3A project has the potential to disturb archaeological resources. Additionally, the I3A project could require bringing cables and conduits into historic buildings, which would necessitate drilling holes in the buildings and possibly other more extensive modifications. Depending on the precise location of cable and conduit placements and the level of renovation needed to the buildings, this project could have an adverse effect on the historic integrity of Cold War era buildings or archaeological sites at PTA. The Army is conducting an evaluation of historic structures in the PTA cantonment area and at BAAF. If avoidance is not feasible, adverse effects on historic buildings would be mitigated by compliance with the Secretary of the Interior's Standards for Treatment of Historic Properties. Impacts on buildings and archaeological sites can be mitigated by compliance with the provisions of the PA.

A tactical vehicle wash would be built during fiscal year 2005. USAG-HI DPW Environmental staff have conducted an assessment of this location and found no cultural resources within the project area (IARII 2003). An archaeological inventory survey would be conducted to confirm this finding prior to initiation of construction.

The Range Maintenance Facility in the PTA cantonment area has no identified archaeological sites within the construction area. A survey would be conducted prior to initiation of construction to identify and evaluate any archaeological sites. If any sites are identified, they would be evaluated for eligibility and mitigation would be conducted in accordance with the PA.

Impacts on archaeological resources from road use. Impacts on sites along PTA Trail from military use of the trail could include erosion and possible vandalism or human access. These impacts are likely to be less than significant and would be mitigated by regular monitoring by installation cultural resources personnel.

Impacts on archaeological resources from fixed tactical internet construction. Eleven FTI antennas would be erected at PTA, WPAA, and several sites off the installation. While antennas would be mounted on existing support structures where feasible, many of the sites would require construction of a new equipment shed to support the facility. This construction itself would be ground disturbing and could result in adverse impacts on archaeological resources. The Army has conducted survey of the sites to ensure no impacts on cultural resources. In addition the Army would develop an IDP to protect subsurface cultural resources discovered

during construction activities. The IDP would be developed in consultation with the SHPO, in accordance with the provisions of the PA.

There would be no impacts on cultural resources from the FTI construction at Kawaihae Harbor, as the project site is completely disturbed, and there are not expected to be any undiscovered cultural resources. Five Cold War era structures at Kawaihae Military Reservation require determinations of eligibility; however, the 7-foot (2.1-meter) antenna support structure to be erected on top of an existing equipment shed would not have any impact on these buildings.

Reduced Land Acquisition Alternative

The RLA Alternative would produce roughly the same impacts as the Proposed Action, because QTR2 would be on the same disturbed areas as the BAX and AALFTR, and thus would not result in any greater impacts on cultural resources.

No Action Alternative

No Impacts

The existing baseline for cultural resources would continue under No Action. Under the status quo of No Action, military use of PTA would continue at current levels. As a result, there would be no new risk of damage to known or undiscovered archaeological resources. Ongoing activities at PTA under No Action include regular uses of the installation for military exercises, in compliance with Army regulations concerning cultural resources preservation and management. Although the WPAA land would not be acquired, any continued use would also fall under the same preservation measures in place at PTA. Under No Action, the TCP survey of PTA would be completed, and any ATIs would be evaluated and managed.